THE CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

CRES Report

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CRES

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Question: Where's the best place to take a gorilla's temperature? Answer: From the other side of the Zoo. CRES researchers, led by Dr. Phil Robinson, are developing a long-distance method to enable them to monitor the body temperature of the Zoo's female gorillas accurately, economically and safely.

A four-inch-long, cigar-shaped radio transmitter, to be implanted beneath the gorilla's skin, will beam signals to a receiver connected to a computer within the Zoo's hospital. CRES researchers will use this information to see if a relationship can be established between the gorilla's body temperature and estrous cycle. If a relationship is found, this knowledge could be used to determine the best time to artificially inseminate the gorilla, a species which has the poorest reproductive rate of all the great apes and is declining in numbers.

Since a rise in body temperature is often the first signal of illness in animals, knowledge gained from CRES' work with the gorillas may ultimately be used to monitor the general health of many endangered species. ■

Not particularly fast, nor even remotely fierce, the shy and diminuitive dik-dik has long been a favorite prey of lions, cheetahs and other predators in its East African home. ''Life is tough for them,'' says CRES researcher Dr. Oliver Ryder. Not helping their numbers has been the emergence of sterile male offspring born to many pairs of normal, healthy parents.

CRES research has found that two species of dik-dik, despite being virtually identical in appearance, have differences in their genetic make-up significant enough that cross-breeding results in sterile male offspring. CRES' chromosomal research helps keepers of collections the world over to ensure proper pairing of dik-dik and many other endangered species. ■

Chinese monals, pheasant-like birds adorned with beautiful gold, green and blue plumage, are among the rarest birds in captivity. In fact, our Zoo has the only Chinese monals outside of China. So when the Zoo's female suffered a leg injury two years ago which made it too uncomfortable for her to support the weight of the male during normal breeding, it could have meant disaster.

Enter CRES. With the absence of a working body of knowledge on the subject, it fell to a CRES team, led by Dr. Barbara Durrant, to pioneer an artificial insemination program for the Chinese monal. Techniques which successfully produced three Temminck's tragopan chicks through artificial insemination last year were implemented this year with the Chinese monal. Just weeks ago, the CRES team was thrilled when a tiny chick pushed through its shell, becoming the first Chinese monal ever produced through artificial insemination. ■

In addition to the Chinese monal, artificial insemination research goes on for six other species of birds, including the Temminck's tragopan and the Himalayan monal. Tucked within these pheasants' oviducts are sperm storage crypts, glands where sperm from the male is stored until it is needed to fertilize an egg.

CRES researchers are seeking to explore the amazing limits of these crypts. A female Temminck's tragopan was recently artificially inseminated two days in a row, instead of the usual once a week. For more than three weeks, she laid fertile eggs without additional insemination.

Knowing the sperm crypt's capacity helps keepers reduce stress and the risk of injury to the birds, since they will not have to be handled for artificial insemination purposes any more than is necessary. Moreover, the benefits of CRES' research are not limited to pheasants, since it is believed that all birds possess sperm crypts. ■

dik-dik

What does a 2-pound black-footed ferret have in common with an 11,000-pound Asian elephant, a 5-ton killer whale and a 300-pound gorilla? The answer is CRES' endocrinology research, which is being used to help establish breeding programs for each of these and many other endangered species.

Prairie dogs, the black-footed ferret's primary food source, are considered by ranchers to be pests and have been largely eradicated from the black-footed ferret's range through the use of poisons. Sylvatic plague has also contributed to the decline of prairie dogs in these areas. Unable to find an adequate alternate source of food, the black-footed ferrets have dropped to a known population of 17 individuals; these have been captured in order to establish a breeding program. When the University of Wyoming, which is coordinating the program, needed help in its effort, it approached CRES.

Led by Nancy Czekala, a CRES team is assisting the university in establishing testing procedures of hormone levels to determine proper pairing and when to begin artificial insemination efforts. ■

Chinese monal

Weighing approximately one-half pound each at birth, two blue-eyed bundles of faintly spotted, gray fur are the most recent additions to the Zoo's clouded leopard collection, which now numbers 10. The birth of Pu-ying and Pu-chai (meaning ''girl'' and ''boy'' in Thai) thrills CRES researchers, who have been closely monitoring the hormonal changes of their mother, named Asia. The arrival of the cubs marks only the third successful birth of this Southeast Asian species at our Zoo.

Little is known about these endangered tree-dwelling cats, a situation CRES has set out to change. In addition to CRES researcher Joan Yamada's work to determine the estrous cycle of the cubs' mother, CRES instigated an international, 12-zoo effort to compile and coordinate research on the beautiful and exotic cat. ■

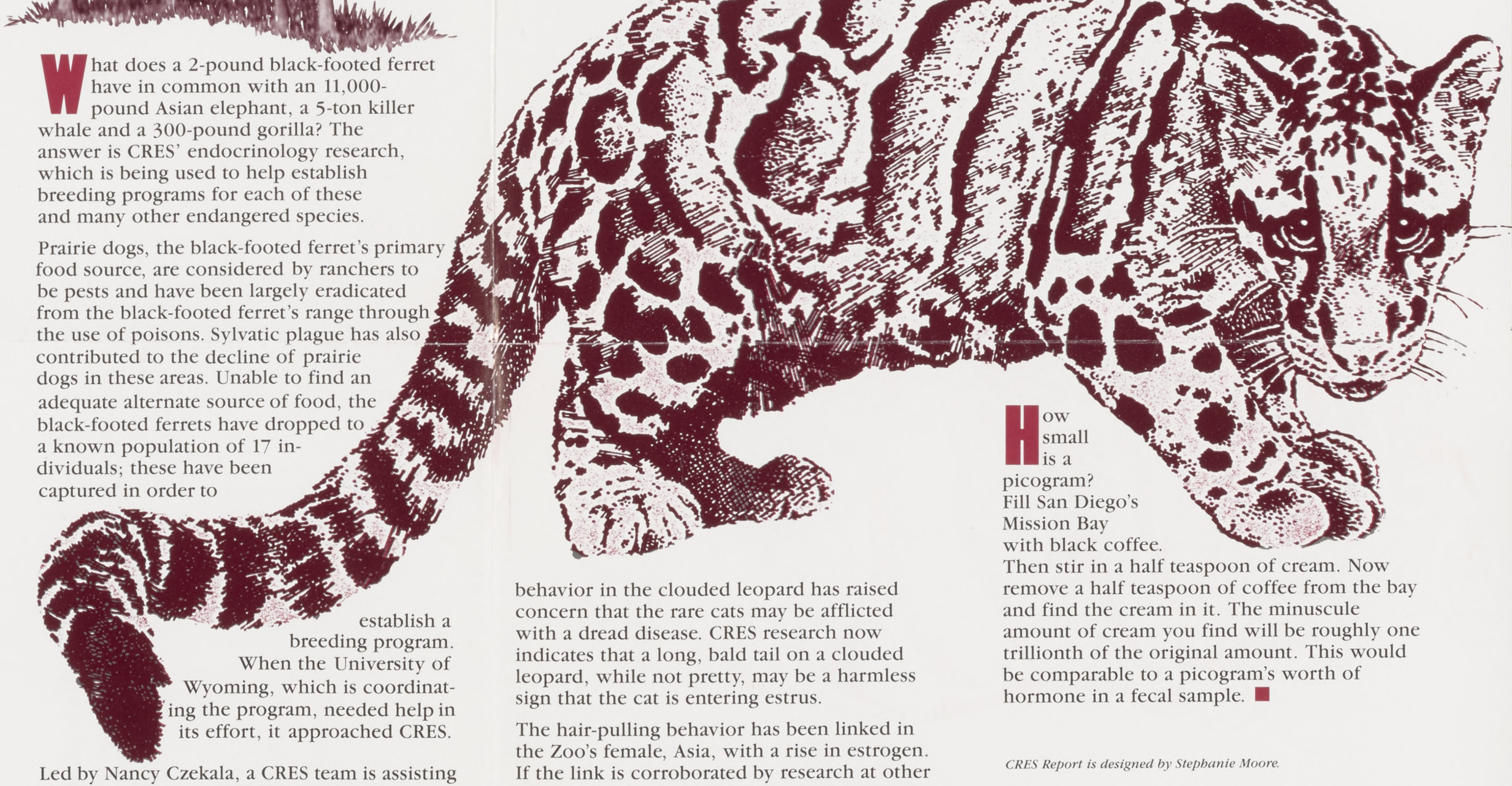
The tendency of some clouded leopards to pull all the hair out of their tails has caused worried keepers the world over to pull out their own. For decades, this unusual behavior in the clouded leopard has raised concern that the rare cats may be afflicted with a dread disease. CRES research now indicates that a long, bald tail on a clouded leopard, while not pretty, may be a harmless sign that the cat is entering estrus.

The hair-pulling behavior has been linked in the Zoo's female, Asia, with a rise in estrogen. If the link is corroborated by research at other zoos, not only could this information assuage the keepers' fear of disease among the prized cats; it could also offer them a simple way to determine when the animals are ready for breeding. ■

Of the 8,900 species of birds that are known to exist, as many as 2,500 are considered to be monomorphic, meaning sexually indistinct in both appearance and behavior. ''The birds themselves know the difference, but we don't,'' says CRES researcher Dr. Arden Bercovitz.

Knowing which sex is which is critically important to ensure proper pairing of birds for breeding purposes. Dr. Bercovitz's goal is to expand and extend non-surgical methods for determining the sex and breeding potential in exotic birds.

This avenue of research began at CRES a decade ago. CRES researchers are now conducting tests to determine the estrogen levels in the droppings of newly hatched Andean condors and peregrine falcons. Extremely sensitive techniques enable CRES researchers to reliably detect minute amounts of hormones at picogram levels. ■



clouded leopard

How small is a picogram? Fill San Diego's Mission Bay with black coffee. Then stir in a half teaspoon of cream. Now remove a half teaspoon of coffee from the bay and find the cream in it. The minuscule amount of cream you find will be roughly one trillionth of the original amount. This would be comparable to a picogram's worth of hormone in a fecal sample. ■

CRES Report is designed by Stephanie Moore.

The Center for Reproduction of Endangered Species (CRES) is operated by the Zoological Society of San Diego, a non-profit organization.